

Amendments to the Claims

This listing of Claims will replace all prior versions and listings of Claims in the application.

Listing of Claims:

1. - 45. (canceled)

46. (currently amended) A shoulder orthosis for effecting rotation of an upper portion of an arm relative to a shoulder joint of a patient, the shoulder orthosis comprising:

a base section adapted to be coupled to a trunk of the patient, the base section having a proximal end portion and a distal end portion;

an upper arm section rotatably coupled to the base section at the proximal end portion for receiving the upper portion of the arm, such that the upper arm section is configured to rotate with respect to the base section about a connection positionable near an armpit of the patient; and

a drive assembly operatively coupled to the upper arm section, and movable with respect to the upper arm section to rotate a humerus bone in the upper portion of the arm relative to a scapula bone [[at]] of the shoulder joint.

47. (previously presented) A shoulder orthosis in accordance with Claim 46 further comprising a lower arm section for receiving a lower portion of the arm, the first drive assembly operatively coupling the lower arm section to the upper arm section.

48. (previously presented) A shoulder orthosis in accordance with Claim 47 wherein the lower arm section maintains the lower portion of the arm substantially orthogonal to the upper portion of the arm.

49. (previously presented) A shoulder orthosis in accordance with Claim 47 wherein the drive assembly is manually operable by the patient to move the lower portion of the arm with respect to the upper portion of the arm to effect one of internal rotation of the humerus bone

relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

50. (previously presented) A shoulder orthosis in accordance with Claim 46 wherein the drive assembly is selectively operable to effect one of internal rotation of the humerus bone relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

51. (previously presented) A shoulder orthosis in accordance with Claim 50 wherein the drive assembly pivots the lower portion of the arm about an axis of the upper portion of the arm to effect rotation of the humerus bone relative to the scapula bone with an axis of the humerus bone substantially aligned with a center of a glenoid cavity defined in the scapula bone to limit movement of the scapula bone relative to the trunk.

52. (previously presented) A shoulder orthosis in accordance with Claim 46 wherein the first drive assembly comprises a drive gear having an axis of rotation aligned relative to an axis of the upper portion of the arm.

53. (previously presented) A shoulder orthosis in accordance with Claim 52 wherein the drive gear defines an opening through which an elbow connecting the upper portion of the arm and the lower portion of the arm is positioned.

54. (previously presented) A shoulder orthosis in accordance with Claim 52 wherein the drive gear comprises an arcuate array of teeth, the drive gear having an axis substantially coincident with a longitudinal axis of the upper arm section.

55. (previously presented) A shoulder orthosis in accordance with Claim 52 further comprising a positioning assembly supporting the drive gear for rotation about the axis of rotation.

56. (previously presented) A shoulder orthosis in accordance with Claim 55 further comprising a pinion gear rotatably mounted to the upper arm section and engaged with the drive gear.

57. (previously presented) A shoulder orthosis in accordance with Claim 56 wherein the positioning assembly comprises at least one guide block coupled to the upper arm section having at least one pin extending into an arcuate groove defined within the drive gear to facilitate rotational movement of the drive gear relative to the upper arm section upon rotation of the pinion gear.

58. (previously presented) A shoulder orthosis in accordance with Claim 56 further comprising a reversible ratchet operatively coupled to the pinion gear to rotate the drive gear to effect one of internal rotation of the humerus bone relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

59. (previously presented) A shoulder orthosis in accordance with Claim 46 wherein the first drive assembly comprises a resilient member configured to pivot the lower portion of the arm.

60. (previously presented) A shoulder orthosis in accordance with Claim 46 further comprising a second drive assembly operable to align the upper portion of the arm with the shoulder joint.

61. (previously presented) A shoulder orthosis in accordance with Claim 46 further comprising a second drive assembly operable to be substantially aligned relative to an axis of the humerus bone with a glenoid cavity of the scapula bone.

62. (previously presented) A shoulder orthosis in accordance with Claim 61 wherein, with the axis of the humerus bone extending substantially through the center of the glenoid cavity, the first drive assembly is movable with respect to the upper arm section to rotate the humerus bone about the axis while the scapula bone remains substantially stationary relative to the trunk.

63. (previously presented) A shoulder orthosis in accordance with Claim 46 further comprising a second drive assembly operatively coupled to the upper arm section to move the upper portion of the arm with respect to the shoulder joint to effect one of abduction and adduction of the arm.

64. (previously presented) A shoulder orthosis in accordance with Claim 46 wherein the first drive assembly is operable to interrupt rotation of the humerus bone with viscoelastic body tissue stretched to an extent compatible with a comfort level of the patient.

65. (previously presented) A shoulder orthosis in accordance with Claim 64 wherein the first drive assembly maintains tension in the viscoelastic body tissue interconnecting the upper portion of the arm and the shoulder joint when operation of the first drive assembly is interrupted.

66. (currently amended) A shoulder orthosis for effecting rotation of an upper portion of an arm relative to a shoulder joint of a patient, the shoulder orthosis comprising:

an upper arm section for receiving the upper portion of the arm;

a lower arm section for receiving a lower portion of the arm and maintaining the lower portion of the arm substantially orthogonal to the upper portion of the arm;

a base section adapted to be coupled to a trunk of the patient, the base section having a proximal end portion and a distal end portion, the upper arm section rotatably coupled to the base section near the proximal end, such that the upper arm section is configured to move with respect to the base section about a connection positioned near an armpit of the patient; and

a drive assembly operatively coupling the lower arm section to the upper arm section, and movable with respect to the upper arm section to rotate a humerus bone in the upper portion of the arm relative to a scapula bone at the shoulder joint of the patient.

67. (currently amended) A shoulder orthosis in accordance with Claim 66 ~~further comprising a wherein the~~ base section ~~pivotaly coupled to the upper arm section and resisting~~ resists movement relative to ~~[[a]] the~~ trunk of the patient.

68. (previously presented) A shoulder orthosis in accordance with Claim 66 wherein the first drive assembly is selectively operable by the patient to move the lower portion of the arm with respect to the upper portion of the arm to effect one of internal rotation of the humerus bone

relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

69. (previously presented) A shoulder orthosis in accordance with Claim 66 wherein the first drive assembly comprises a drive gear having an axis of rotation along a central axis of the upper portion of the arm.

70. (previously presented) A shoulder orthosis in accordance with Claim 69 wherein the drive gear comprises an arcuate array of teeth forming a portion of a circle, the drive gear having an axis substantially aligned with an axis of the upper arm section.

71. (previously presented) A shoulder orthosis in accordance with Claim 69 wherein the drive gear is fixedly coupled to the lower arm section.

72. (previously presented) A shoulder orthosis in accordance with Claim 69 further comprising a reversible ratchet operatively coupled to the drive gear to rotate the drive gear to effect one of internal rotation of the humerus bone relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

73. (previously presented) A shoulder orthosis in accordance with Claim 66 wherein the first drive assembly comprises a resilient member to pivot the lower portion of the arm about an axis of the upper portion of the arm to effect rotation of the humerus bone relative to the scapula bone with an axis of the humerus bone aligned with a center of a glenoid cavity defined in the scapula bone to limit movement of the scapula bone relative to the trunk.

74. (previously presented) A shoulder orthosis in accordance with Claim 66 further comprising a second drive assembly operable to align the upper portion of the arm with the shoulder joint.

75. (previously presented) A shoulder orthosis in accordance with Claim 66 further comprising a second drive assembly operable to align an axis of the humerus bone with a center of a glenoid cavity defined in the scapula bone.

76. (previously presented) A shoulder orthosis in accordance with Claim 66 further comprising a second drive assembly operatively coupled to the upper arm section to move the upper portion of the arm with respect to the shoulder joint to effect one of abduction and adduction of the arm.

77. (previously presented) A shoulder orthosis in accordance with Claim 66 wherein the first drive assembly is operable to interrupt rotation of the humerus bone with viscoelastic body tissue stretched to a maximum extent compatible with a comfort level of the patient.

78. (previously presented) A shoulder orthosis in accordance with Claim 77 wherein the first drive assembly maintains tension in the viscoelastic body tissue interconnecting the upper portion of the arm and the shoulder joint when operation of the first drive assembly is interrupted.

79. (currently amended) An orthosis for effecting rotation of a limb relative to a joint of a patient, the orthosis comprising:

a base section adapted to be coupled to a trunk of the patient, the base section having a proximal end portion and a distal end portion;

a first section rotatably coupled to the base section at the proximal end portion for receiving a proximal portion of the limb, such that the upper arm section is configured to move with respect to the base section about a connection positioned near an armpit of the patient; and

a drive assembly operatively coupled to the first section to rotate a bone relative to the joint of the patient.

80. (previously presented) An orthosis in accordance with Claim 79 further comprising a second section for receiving a distal portion of the limb, the drive assembly operatively coupling the second section to the first section.

81. (currently amended) A method for assembling a shoulder orthosis, the method comprising:

configuring an upper arm section for receiving the upper portion of the arm;

configuring a lower arm section for receiving a lower portion of the arm to maintain the lower portion of the arm substantially orthogonal to the upper portion of the arm;

configuring a base section to a trunk of the patient, the base section having a proximal end portion and a distal end portion;

rotationally coupling the upper arm section to the base section at the proximal end portion, such that the upper arm section is configured to move with respect to the base section about a connection positionable beneath an armpit of the patient; and

operatively coupling the lower arm section to the upper arm section with a first drive assembly that is movable with respect to the upper arm section to rotate a humerus bone in the upper portion of the arm relative to a scapula bone at the shoulder joint of the patient.

82. (currently amended) A method in accordance with Claim 81 further ~~comprising pivotally coupling wherein configuring~~ a base section ~~to the upper arm section configured further comprises configuring a base section~~ to resist movement relative to ~~[[a]]~~ the trunk of the patient.

83. (previously presented) A method in accordance with Claim 81 wherein operatively coupling the lower arm section to the upper arm section comprises coupling the first drive assembly such that the first drive assembly is selectively operable by the patient to move the lower portion of the arm with respect to the upper portion of the arm to effect one of internal rotation of the humerus bone relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

84. (previously presented) A method in accordance with Claim 81 further comprising coupling the first drive assembly to a drive gear having an axis of rotation along an axis of the upper portion of the arm.

85. (previously presented) A method in accordance with Claim 84 wherein coupling the first drive assembly to a drive gear includes coupling a drive gear including an arcuate array of

teeth forming a portion of a circle, the drive gear having an axis substantially aligned with an axis of the upper arm section.

86. (previously presented) A method in accordance with Claim 84 further comprising fixedly coupling the drive gear to the lower arm section.

87. (currently amended) A method in accordance with Claim 84 further comprising operatively coupling a ~~reversible~~ ratchet to the drive gear to rotate the drive gear to effect one of internal rotation of the humerus bone relative to the scapula bone and external rotation of the humerus bone relative to the scapula bone.

88. (currently amended) A method in accordance with Claim 81 wherein coupling the first drive assembly further comprises coupling the first drive assembly including a resilient member to ~~[[pivot]]~~ rotate the lower portion of the arm about ~~a-central~~ an axis of the upper portion of the arm to effect rotation of the humerus bone relative to the scapula bone with a ~~central~~ an axis of the humerus bone substantially aligned with a center of a glenoid cavity defined in the scapula bone to limit movement of the scapula bone relative to the trunk.

89. (previously presented) A method in accordance with Claim 81 further comprising operatively coupling a second drive assembly to the upper arm section to align the upper portion of the arm with the shoulder joint.

90. (previously presented) A method in accordance with Claim 81 further comprising operatively coupling a second drive assembly to the upper arm section to substantially align an axis of the humerus bone with a center of a glenoid cavity defined in the scapula bone.

91. (previously presented) A method in accordance with Claim 81 further comprising operatively coupling a second drive assembly to the upper arm section to move the upper portion of the arm with respect to the shoulder joint to effect one of abduction and adduction of the arm.

92. (currently amended) A method in accordance with Claim 81 wherein coupling the first drive assembly further comprises coupling the first drive assembly that is configured to

interrupt rotation of the humerus bone with viscoelastic body tissue stretched to a maximum extent compatible with a comfort level of the patient.

93. (currently amended) A method in accordance with Claim 92 wherein coupling the first drive assembly further comprises coupling the first drive assembly that is configured to maintain tension in the viscoelastic body tissue interconnecting the upper portion of the arm and the shoulder joint when operation of the first drive assembly is interrupted.